Patent claims

1. A metallic protective layer,
consisting of (in percent by weight wt%)
11.5 to 20.0% chromium,
0.3 to 1.5% silicon,
0.0 to 1.0% aluminum,
0.0 to 0.7 wt% yttrium and/or at least one metal selected from the group consisting of scandium and the rare earth elements,
remainder iron and production-related impurities.

2. The metallic protective layer as claimed in claim 1,
consisting of (in percent by weight wt%)
12.5 to 14.0% chromium,
0.5 to 1.0% silicon,
0.1 to 0.5% aluminum,
remainder iron and production-related impurities.

3. A layer system,
at least comprising a substrate (4)
and a metallic protective layer (7) as claimed in claim 1 or 2 on the substrate (4).

4. The layer system as claimed in claim 3,
characterized in that
the substrate (4) is metallic or ceramic.

5. The layer system as claimed in claim 3 or 4, characterized in that the substrate (4) is a ferritic base alloy, a steel or a nickel-base or cobalt-base superalloy.

6. The layer system as claimed in claims 3 to 5, characterized in that the metallic protective layer (7) is ferritic.

7. The layer system as claimed in claim 3, 5 or 6, characterized in that the metallic protective layer (7) and the substrate (4) are ferritic.

8. The layer system as claimed in claim 3 or 7, characterized in that the protective layer (7) bonds to the substrate (4) by adhesion.

9. The layer system as claimed in claim 3, 7 or 8, characterized in that the layer system (1) has not undergone any diffusion treatment.

10. The layer system as claimed in claim 7, 8 or 9, characterized in that the coefficients of thermal expansion α of the protective layer (7), in particular of the ferritic protective layer (7), and of the substrate (4), in particular of the ferritic substrate (4), are equal, virtually equal or have a difference of up to 10% in the expansion coefficients α.

11. The layer system as claimed in claims 3 to 10, characterized in that the substrate (4) is an iron-base alloy, in particular a 1% CrMoV steel or a 10 to 12% chromium steel.

12. The layer system as claimed in claims 3 to 10, characterized in that the substrate (4) is a 1% to 2% Cr steel, in particular 30CrMoNiV5-11 or 23CrMoNiWV8-8 or G17CrMoV5-10 or G17CrMo9-10, or a 10% Cr steel, in particular X12CrMoWVNbN10-1-1 or GX12CrMoWVNbN10-1-1 or GX12CrMoVNbN9-1.

13. The layer system as claimed in claim 3, characterized in that a ceramic layer (10) is present on the metallic protective layer (7).

14. The layer system as claimed in claim 13, characterized in that the ceramic layer (10) is a thermal barrier coating, in particular based on zirconium oxide.

15. The layer system as claimed in claim 3 or 14, characterized in that the layer system (1) is a layer system (1) of a component (110, 120, 130) of a gas turbine (100) or is a component (333, 354, 357, 366) of a steam turbine (300, 303).

16. The layer system as claimed in claim 3 or 15, characterized in that the layer system (1) is a turbine blade or vane (120, 130, 354, 357, 366) or in that the layer system (1) is a housing part or a region of a housing of a turbine (100, 300, 303), or in that the layer system (1) is a lining (155) of a combustion chamber (110).

17. The layer system as claimed in claim 3, 15 to 19, characterized in that
the layer system (1) is arranged on a newly produced component, in particular for a turbine blade or vane (120, 130, 354, 357, 366).

18. The layer system as claimed in claim 3, 15 to 19, characterized in that
the layer system (1) is present on a refurbished component, in particular for a turbine blade or vane (120, 130, 354, 357, 366).